

SOUTH AUSTRALIAN POLYPLACOPHORA.

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PLATES V. TO VII.

I have been invited by the President of the Royal Society of South Australia, Dr. J. C. Verco, to write a paper on the Polyplacophora, or multivalve-molluscs, of South Australia.

Since the publication of Mr. W. T. Bednall's paper on "South Australian Polyplacophora" in the Proceedings of the Malacological Society of London, vol. ii., part 4, April, 1897, a great impetus has been given to this interesting study in South Australia, and numbers of collectors have been at work, the following having written papers on the subject:—

W. G. Torr and Edwin Ashby, *Trans. Roy. Soc., S.A.*, 1898; Edwin Ashby, *Trans. Roy. Soc., S.A.*, 1900; M. M. Maughan, *Trans. Roy. Soc., S.A.*, 1900; W. T. Bednall and E. H. Matthews, *Proc. Mal. Soc., London*, vol. vii., part 2, June, 1906; Tom Iredale, *Proc. Mal. Soc., London*, June, 1910, and September, 1910.

To these writers I make my acknowledgments, as well as to the publishers of Tryon's *Man. Conch.*, vols. xiv. and xv.; E. R. Sykes, on Victorian Polyplacophora, *Proc. Mal. Soc., London*, vol. ii., part 2, July, 1896; A. F. Basset Hull, *Australian Naturalist*, April, 1908; W. G. Torr, *Western Australian Polyplacophora*, *Trans. Roy. Soc., S.A.*, vol. xxxv., 1911; Torr and May, *Proc. Royal Society of Tasmania*, 1912; Henry Suter, *New Zealand Polyplacophora*, *Journ. Mal.*, 1905, vol. xii., part 4; C. Hedley and A. F. Basset Hull, *Records Australian Museum*, vol. vii., No. 4, 1909; and Prof. J. Thiele (Berlin), *Die Fauna Südwest-Australiens*, Band iii., Lieferung ii., 1911.

There are other numerous references to Polyplacophora in various papers which I have examined:—

G. F. Angas' list, *Proc. Zool. Soc., London*, January, 1865, consisted of fourteen species; of these four have been omitted as uncertain.

D. J. Adcock's list, published in 1893, contained eighteen species, of which eight have not been identified.

Mr. Bednall, in the *Proc. Mal. Soc., London*, 1897, published thirty-seven species, of which one has been omitted.

Messrs. Maughan, Torr and Ashby, and Bednall and Matthews have brought up the list to fifty-two species, and this paper will raise the number to sixty-one identified species. Some of the names have had to be changed owing to Dr. Thiele and Mr. Tom Iredale's observations of the original specimens of Blainville and others.

My collection of chitons extends over practically the whole of the South Australian coastline from Port MacDonnell to Nuyt Archipelago in the Australian Bight.

The South Australian Polyplacophora include the following families:—*Lepidopleuridæ*, Pilsbry; *Ischnochitonidæ*, Pilsbry; *Mopaliidæ*, Pilsbry; *Acanthochitidæ*, Pilsbry; *Cryptoplacidæ*, Dall; and *Chitonidæ*, Pilsbry.

The order of exposure of South Australian Polyplacophora, *mutatis mutandis*, is *P. albida*, Blainville, on exposed rocks at or near high-water mark, sometimes accompanied by *P. costata*, Blainville, with *P. matthewsi*, Iredale, under rocks in deeper water. *I. crispus* is in abundance almost everywhere a foot or two below high-water mark, sometimes accompanied by *I. thomasi* or *I. vergatus*. The *Acanthochites* are found in sheltered pools on sandy weed-covered rocks. In deeper pools *I. contractus*, *I. cariosus*, *I. ustulatus*, *I. sulcatus*, and other *Ischnochitonidæ* are found, and deeper still *I. smaragdinus*, *I. ptychius*, *Lorica volvox*, *Loricella angasi*, *I. pilsbryi*, and most of the true chitons, *jugosus*, *tricostalis*, *exoptandus*, *calliozona*, and *torrianus*. On the west side of St. Vincent Gulf I have found true chitons on exposed rocks in shallow pools at low water. *I. tateanus*, *C. verconis*, *A. verconis*, and *C. bednalli* are, as a rule, obtained only by dredging.

Fam. LEPIDOPLEURIDÆ, Pilsbry.

1. *Lepidopleurus inquinatus*, Reeve, 1847.

Chiton inquinatus, Reeve, Conch. Icon., sp. 154.

Ischnochiton inquinatus, Reeve: Pilsbry, Man. Conch., ser. i., vol. xiv., p. 90.

Lepidopleurus liratus, H. Adams and Angas, Proc. Zool. Soc., 1864, p. 192; Angas, *loc. cit.*, 1865, p. 187; Pilsbry, Man. Conch., ser. i., vol. xv., p. 101.

L. inquinatus, Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 141; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 86.

Specimens of this diminutive chiton have been found all along the coast of South Australia extending from Port MacDonnell to St. Francis Island, Nuyt Archipelago. The writer has specimens from Corney Point, Wool Bay, Marino,

Noarlunga, Robe, Cape Jaffa, Minlacowie, and St. Francis Island. Large specimens, 20 mm. long and 8 mm. broad, have been dredged in St. Vincent Gulf by Dr. Verco.

2. **Lepidopleurus matthewsianus**, Bednall, 1906.

Lepidopleurus matthewsianus, Bednall, Proc. Mal. Soc., London, vol. vii., part 2, June, 1906.

Specimens have been obtained from Port MacDonnell, Encounter Bay, Normanville, Noarlunga, Marino, Wool Bay, Corney Point, Hardwicke Bay, and St. Francis Island. I have also taken it at Burnie and Devonport, on the north-west coast of Tasmania. The sanguineous appearance of the foot of this animal is peculiar.

Fam. ISCHNOCHITONIDÆ, Pilsbry.

3. **Callochiton platessa**, Gould, 1846.

Callochiton platessa (Gould): Haddon, "Challenger" Report, p. 15; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 141; Proc. Acad. Nat. Sci., Philad., 1894, p. 71; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 86.

Chiton platessa, Gould, Proc. Boston Soc. Nat. Hist., vol. ii., 1846, p. 143; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 49; Gould, U.S. Explor. Exped., p. 320, atlas, figs. 434, 434a.

Lepidopleurus platessa, Gould, Otia (Rectifications), 1862, p. 242.

Chiton crocinus, Reeve, Conch. Icon., pl. xxii., fig. 146, 1847.

Callochiton crocinus, Reeve: Pilsbry, Man. Conch., ser. i., vol. xiv., p. 50; vol. xv., p. 67.

Leptochiton versicolor, A. Adams, Proc. Zool. Soc., 1852, p. 92, May, 1854; Angas, Proc. Zool. Soc., 1867, p. 223.

Lepidopleurus empleurus, Hutton, Trans. N.Z. Inst., vol. iv., p. 178; Man. N.Z. Moll., p. 113, 1880; Pilsbry, Man. Conch., ser. i., vol. xv., p. 67.

Common in New South Wales, but rare in South Australia. Specimens have been obtained from Cape Jaffa, Second Valley, Aldinga, Marino, Corney Point, and valves have been dredged in Spencer Gulf. A very fine specimen, measuring 24 × 13 mm., was found by Mr. F. L. Saunders at Marino.

4. **Callochiton rufus**, Ashby, 1910.

Callochiton rufus, Ashby, Trans. Roy. Soc., S.A., 1900, p. 87; Die Fauna Südwest-Australien, Thiele, Band. iii., Lieferung ii., 1911.

One specimen only of this beautiful chiton was dredged by Dr. Verco in St. Vincent Gulf. It has been found by Dr. Thiele in Shark Bay, Western Australia.

5. **Ischnochiton** (*Stenochiton*) **juloides**, Adams and Angas, 1865.

Stenochiton juloides, Adams and Angas, Proc. Zool. Soc., 1864, p. 193; *op. cit.*, 1865; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 55.

Ischnochiton (*Stenochiton*) *juloides*, Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 142; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 87.

Hab.—Holdfast Bay (Angas), Largs Bay (Adcock), Yorke Peninsula (Matthews).

I have specimens (whole or valves) from St. Francis Island (dredging and shore), Port MacDonnell, Carrowa (West Coast), Hardwicke Bay, Spencer Gulf (dredging), Kangaroo Island, Troubridge Reef, Glenelg, Brighton, Largs Bay, and Fowler Bay. Valves are frequently found in shell sand. Mr. A. R. Riddle informs me that he has found them on *Pinna inermis*, old boots and bottles, and especially near the roots of *Zostera* at an extremely low tide, by dredging or with a grappling-iron. They are rarely found in shallow water.

6. **Ischnochiton** (*Stenochiton*) **pilsbryanus**, Bednall, 1896.

Ischnochiton (*Stenochiton*) *pilsbryanus*, Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 142.

Type specimens found on seaweed, Troubridge Shoal, St. Vincent Gulf.

I have specimens from Tapley Shoal living in *Zostera* (seaweed), dredged specimens from Spencer Gulf and off St. Francis Island, live specimens and numerous valves in from 6 to 20 fathoms of water. Two large specimens were found by Mr. F. L. Saunders on seaweed at Aldinga; they measured 9.5 × 3 mm. A number of very fine variegated specimens of this chiton have been found near the roots of *Zostera* at Wool Bay and other places by Mr. A. R. Riddle. The largest specimen measures 17 × 5 mm.

7. **Ischnochiton** (*Stenochiton*) **pallens**, Ashby, 1900.

Ischnochiton (*Stenochiton*) *pallens*, Ashby, Trans. Roy. Soc., S.A., 1900.

Dredged in St. Vincent Gulf by Dr. Verco. I found one specimen in shell sand at Aldinga, and Mr. Zietz collected a pretty buff specimen from Largs Bay. This species differs from *I. pilsbryanus* in the rapid tapering of the tail valves. As I have not had access to the type specimens of either *pilsbryanus* or *pallens*, it may be that my specimens may have to be reconsidered.

8. **Ischnochiton** (*Heterozona*) **cariosus**, Carpenter, MS. :
Pilsbry, 1873.

Heterozona cariosa, Carpenter, MS. : Pilsbry, Man. Conch., ser. i., vol. xiv., p. 65; vol. xv., p. 82.

Ischnochiton (*Heterozona*) *cariosus*, Pilsbry: Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 143; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 87.

This shell is widely distributed. It is abundant in Spencer and St. Vincent Gulfs, and the writer has collected it on St. Francis Island and all around the coast of Western Australia as far as Fremantle. It is often covered with *Serpularia* and has a *cariosus* appearance, hence its name.

9. **Ischnochiton** **pilsbryi**, Bednall, 1896.

Ischnochiton pilsbryi, Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 143.

Found at Sultana Bay (Bednall) and at Hickey Point, Y.P., and St. Francis Island by the writer. Most of the specimens were found on rocks embedded in the sand. At first sight it might be mistaken for *crispus* or *cariosus*, but markings and girdle scales are very distinct, and all the specimens are "uniform ochraceous-yellow."

10. **Ischnochiton** **ustulatus**, Reeve, 1847.

Chiton ustulatus, Reeve, Conch. Icon., sp. 102; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 96.

Ischnochiton ustulatus, Carpenter, MS. : Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 88.

Lepidopleurus ustulatus, Angas, P.Z.S., 1867, p. 222.

When alive this shell is very brilliant, almost crimson; but it loses its colour in formalin, methylated spirits, or when dry, and retains its singed appearance from which it derives its name. The writer has traced it all around the coast from Cape Jaffa to St. Francis Island. He also found it in Western Australia. An abnormal specimen was found by Mr. F. L. Saunders at Second Valley. It is much broader than the usual types; it measures 37×18 mm.

This chiton easily changes its *habitat*. Scores of specimens seen by Mr. Matthews on Yorke Peninsula one week were not able to be discovered the week following.

11. **Ischnochiton** **crispus**, Reeve, 1847.

Chiton crispus, Reeve, Conch. Icon., sp. 120; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 89.

Ischnochiton haddoni, Pilsbry, Man. Conch., ser. i., vol. xiv., p. 88.

Ischnochiton crispus, Reeve: Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 145; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 87.

Chiton longicymba, Blainville: Sowerby, Conch. Illus., fig. 67; Reeve, Conch. Icon., pl. xxiv., fig. 163 (*non* Blainville).

Ischnochiton longicymba, Blainville: Hutton, "Challenger" Report, p. 17 (*non* Blainville).

This very variable shell is found abundantly on the coasts of New South Wales, Victoria, Tasmania, and South Australia. The writer has specimens from almost every part of the South Australian coast from Port MacDonnell to St. Francis Island in the Australian Bight. It is not found in Western Australia. I collected a *five-valved* specimen at Ulverstone, Tasmania.

No chiton varies so much in colouration as *I. crispus*. I have pale emerald-green, black with a white stripe on the dorsal area, and white with a black stripe, brown and yellow. The commonest kind is a pale-yellow ochre colour. A very beautiful species has been called var. *decoratus*. It has a milky-white ground with regular green or brown longitudinal markings continued throughout the valves. The description given by Pilsbry, *loc. cit.*, of *I. haddoni* agrees with the shell better than any other I have seen.

12. *Ischnochiton fruticosus*, Gould, 1846.

Chiton fruticosus, Gould, Proc. Boston Soc. Nat. Hist., ii., p. 142; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 91; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 145.

Ischnochiton fruticosus, Gould: Pilsbry, Proc. Acad. Nat. Soc., Philad., 1894, p. 72.

This common New South Wales species is very rare in South Australian waters. The writer has examined hundreds of specimens similar to *fruticosus* and has only found one in South Australia with the striations on the girdle scales. One specimen only was found by Mr. E. H. Matthews on Southern Yorke Peninsula.

13. *Ischnochiton contractus*, Reeve, 1847.

Chiton contractus, Reeve, Conch. Icon., sp. 78; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 93.

Ischnochiton contractus, Reeve: Pilsbry, Man. Conch., ser. i., vol. xiv., p. 93; Nautilus, vol. viii., p. 129; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 87; Bednall, Proc., Mal. Soc., London, vol. ii., part 4, April, 1897, p. 145.

Chiton pallidus, Reeve, Conch. Icon., sp. 92, March, 1847; Pilsbry, Man. Conch., ser. ix., vol. xiv., p. 89.

Other synonyms are given by Pilsbry which are evidently intended, according to Bednall and Iredale, for *I. decussatus*.

Many scores of specimens are in my cabinet from both Gulf St. Vincent and Spencer Gulf, also from Hopetoun and Albany, in Western Australia. I have dried specimens 46 mm. long and 22 mm. broad.

14. **Ischnochiton variegatus**, Adams and Angas, 1864.

Lepidopleurus variegatus, H. Adams and Angas, Proc. Zool. Soc., 1864, p. 192; Pilsbry, Man. Conch., ser. i., vol. xv., p. 102.

Ischnochiton variegatus, Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 146.

This species is found in Spencer and St. Vincent gulfs. It will probably be classed under *I. crispus*, which it closely resembles. Pilsbry has no plates of this variety in his Manual, and the description given would equally apply to *I. crispus*. Bednall says it attains a length of two-thirds of an inch. I have a number of specimens from the coasts of Yorke Peninsula, Port MacDonnell, Cape Jaffa, and Marino. It is probably a cream-coloured variety of *crispus*.

15. **Ischnochiton sulcatus**, Quoy and Gaimard, 1834.

Chiton sulcatus, Quoy and Gaimard, Voy. "Astrolabe," Zool., 1834, vol. iii., p. 385.

C. decussatus, Reeve, Conch. Icon., 1847, pl. xviii., fig. 107.

C. castus, Reeve, *op. cit.*, pl. xxii., fig. 145.

Lepidopleurus speciosus, Adams and Angas, P.Z.S., 1864, p. 192; 1865, p. 187.

Gymnoplax urvillei, Rochebrune, Bull. Soc. Philom., Paris, 1880-1, p. 121.

Ischnochiton sulcatus, Quoy and Gaimard: Pilsbry, Man. Conch., 1893, ser. i., vol. xiv., p. 138; Iredale, Proc. Mal. Soc., London, vol. ix., part 2, June, 1910, p. 91.

I. decussatus, Reeve: Bednall, Proc. Mal. Soc., London, 1897, vol. ii., p. 146.

The most beautiful of the South Australian *Ischnochitons* may be easily distinguished by being broader in proportion to its length than the majority of *Ischnochitons*. It favours the edges of rocks, and is often found on top of stones and on the razor-like bivalve, *Pinna inermis*. The colours are very various—blue-green, rich brown, cream with brown dorsal areas, ochreous-yellow with splashes of purple, straw-colour with dark-brown splashes, brown and green with cream-white dorsal areas, and uniformly cream. I have dried specimens, 46 mm. long and 27 mm. broad. Juveniles may be easily distinguished by the regular pustules in the anterior and posterior valves and the lateral areas of the median valves. They are common in Spencer and St. Vincent gulfs, Streaky Bay, and West Coast.

16. *Ischnochiton ptychius*, Pilsbry.

Ischnochiton ptychius, Pilsbry: Nautilus, vol. viii., p. 53; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 147.

It is often placed among *crispus*, but as a rule is found in much deeper water. I have specimens from Robe, Cape Jaffa, Second Valley, Normanville, Marino, and Southern Yorke Peninsula. Good specimens were taken by Mr. A. R. Riddle on broken *Haliotidæ* at Marion Reef, and also in a deep rock pool at Black Hill, near Port Moorowie. The strong serrations at the sutural margins of the valves, mentioned by Mr. Bednall, are plainly distinguishable in some specimens. In others they are missing, although taken at the same spot and similar in every other particular.

"It is a small oval pink-tinged shell, with wrinkled striations on the dorsal areas, and somewhat coarse concentric sulcations on the lateral areas, which are strongly serrated at the sutural margin."

It is somewhat difficult for a beginner to separate it from *I. crispus*.

I. ptychius has finely striated girdle scales.

17. *Ischnochiton tateanus*, Bednall, 1896.

Ischnochiton tateanus, Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 147; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 87.

It may be distinguished by its form. In well-preserved specimens the width is nearly two-thirds of the length, and the fine serrations on the posterior edge of the lateral areas of the median valve are distinctly seen in most of the specimens.

I. tateanus is rarely found near the shore. It is a deep-water species. Dr. Verco has dredged several in St. Vincent and Spencer gulfs, and valves have been taken at St. Francis Island in 19 fathoms of water. A beautiful specimen was taken by Mr. F. L. Saunders at Marino. It is a pale-chocolate on the dorsal area, throughout the valves, and the lateral and pleural areas of the second, sixth, and seventh valves are creamy-white.

17A. *Ischnochiton wilsoni*, Sykes, 1896.

Ischnochiton wilsoni, Sykes, Proc. Mal. Soc., vol. ii., part 2, July, 1896, p. 89.

One specimen dredged by Dr. Verco and one procured by Mr. Matthews are probably all that have been found in South Australian waters. The writer has one specimen 9 × 5 mm. from Marino (?). In this sample the granulations

in the pleural area are, under a $\frac{1}{4}$ -in. lens, arrow-shaped, with the point towards the dorsal area.

Mr. Matthews has kindly sent me a very fine specimen, 24 x 14 mm., which I take to be *I. wilsoni*. It has not the rosy-pink of the *type*, but the splashes of grey-brown and white correspond with Syke's drawing. The girdle scales are black, amber, and pearly-white, the rich brown splashes predominating. As far as I can decide with an undissected specimen, the anterior valve has nine and the posterior valve eight slits. The striations of the girdle scales are very distinct, four to seven striæ on each scale.

18. *Ischnochiton smaragdinus*, Angas, 1867.

Lophyrus smaragdinus, Angas, Proc. Zool. Soc., 1867, p. 115; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 137, vol. xv., pl. xv., fig. 27.

Lepidopleurus smaragdinus, Carpenter, MS.

Ischnochiton smaragdinus, Bednall, Proc. Mal. Soc., London, vol. ii., part 4., April, 1897, p. 148.

I. (Haploplax) smaragdinus, Angas: Pilsbry, Proc. Acad. Nat. Sci., Philad., 1894, p. 72.

The drawing of this shell in Pilsbry's Manual is very unsatisfactory. Both Angas' and Carpenter's descriptions seem incomplete. This shell may be distinguished by the blue-green spots on an olive-brown ground and the very pearly scales on the girdle. It is generally found in deeper water than the majority of *Ischnochitons*. It has the blue spots of *I. lentiginosus* of New South Wales, but it is not so carinated nor are the lateral areas so distinct as in *I. lentiginosus*. I have specimens from Yankalilla, Normanville, Second Valley, Aldinga, Marino, and elsewhere. It is exceedingly common on the north-west coast of Tasmania, where it is found in shallower water than in South Australia. I have considerable difficulty in separating this species from *Ischnochiton resplendens*, Bednall and Matthews, Proc. Mal. Soc., London, vol. ii., part 2, June, 1906.

19. *Ischnochiton virgatus*, Reeve, 1848.

Chiton virgatus, Reeve, Conch. Icon., sp. 192; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 78.

Trachydermon virgatus, Reeve: Carpenter, MS., p. 22.

Ischnochiton virgatus, Reeve: Carpenter, MS., p. 106; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 148.

This very pretty diminutive chiton, so ably described by Mr. Bednall, *loc. cit.*, has been found all along the South Australian coast from Port MacDonnell to St. Francis Island. I have specimens from nineteen different places, in-

cluding Kangaroo Island. I also collected it at Albany, Western Australia. Some very dark specimens were collected at Streaky Bay, which seemed a variety if not a new species. Under a $\frac{1}{4}$ -in. lens the girdle scales of *virgatus* are minutely striated. Carpenter says they are *not* striated. I have counted from ten to twelve striæ.

20. *Ischnochiton thomasi*, Bednall, 1896.

Ischnochiton thomasi, Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897.

The polished mottled appearance and pearly girdle scales are the distinctive features of this chiton. There are several varieties. I have specimens from Robe, Cape Jaffa, Second Valley, Normanville, Aldinga, Marino, Minlacowie, Southern Yorke Peninsula, and Venus Bay. It thus traverses the greater part of the South Australian coastline.

21. *Ischnochiton resplendens*, Bednall and Matthews, 1906.

Ischnochiton resplendens, Bednall and Matthews, Proc. Mal. Soc., London, vol. vii., part 2, June, 1906.

After careful examination of a number of specimens of this very beautiful *Ischnochiton* I can only place it as a colour variety of *I. smaragdinus*. While the appearance of some specimens varies considerably from *smaragdinus*, by putting a series, they run into one another, till it becomes practically impossible to separate them. I have *smaragdinus* 20 mm. long by 12 mm. broad, which is nearly as large as the type specimen of *resplendens*, and the colour-marking is hardly sufficient to make a new species. I have specimens from Port MacDonnell, Beachport, Cape Jaffa, Robe, Encounter Bay, Marino, Kangaroo Island, Minlacowie, Hardwicke Bay, and Corney Point. My specimens from Robe resemble Mr. Bednall's description. Specimens have also been taken in Wool Bay by Mr. A. R. Riddle.

22. *Ischnochiton gryei*, Filhol, 1880.

Tonicia gryei, Filhol, Comptes Rendus, 1880, vol. xci., p. 1095.

Lepidopleurus melanterus, Rochebrune, Bull. Soc. Philom., Paris, 1883-4, p. 37.

Ischnochiton parkeri, Suter, Proc. Mal. Soc., 1897, vol. ii., p. 186.

I. fulvus, Suter, Journ. Malac., 1905, vol. xii., part 4, p. 66; Iredale, Trans. N.Z. Inst., 1907 (1908), vol. xi., p. 373.

I. gryei, Filhol: Iredale, Proc. Mal. Soc., London, vol. ix., part 2, June, 1910, p. 91.

Going through Mr. Suter's specimens in Auckland, New Zealand, the author remarked that he had seen specimens

of a red *crispus* in South Australia similar to what Suter called *I. fulvus*. On his return to South Australia some specimens were sent to Mr. Suter, some of which were identified with *I. fulvus*, others with *I. crispus*. Some very beautiful specimens of *I. gryei* were taken off Port MacDonnell jetty and Cape Jaffa. The identification will require future consideration. Mr. Sanders found several diminutive specimens at Second Valley, which I take to be *gryei*.

23. **Ischnochiton** (*Ischnoradsia*) **novæ-hollandiæ**,
Gray and Reeve, 1847.

Chiton novæ-hollandiæ, Gray, M.S.: Reeve, Conch. Icon., sp. 142; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 145.

C. (Lophyrus) australis, Tenison-Woods, Proc. Roy. Soc., Tasmania, 1877, p. 46 (*non* Pilsbry).

Ischnochiton (Ischnoradsia) novæ-hollandiæ, Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 150.

Strongly resembles *I. australis*, Sowerby, but the lateral areas of *australis* are much more deeply sulcated than those of *novæ-hollandiæ*, and the pleural areas of the former are longitudinally ribbed, although I have found some *novæ-hollandiæ* slightly ribbed in the pleural areas.

Some specimens in my collection labelled Marino, South Australia, are certainly *I. australis*, but further investigation must be made before placing it on the list of South Australian chitons.

I. novæ-hollandiæ favours the open ocean beaches. I have specimens from Encounter Bay, Tunghkalilla (large numbers), Kangaroo Island, and Second Valley; also from Penguin, Stanley, Wynyside, and Devonport in Tasmania, and Beaumaris, New South Wales. One dried specimen is 65 mm. long and 35 mm. broad. *I. australis* is common in New South Wales. The Tasmanian species show longitudinal riblets in the pleural areas.

Subfam. CALLISTOPLACINÆ, Pilsbry.

24. **Callistochiton antiquus**, Reeve, 1847 (?).

Chiton antiquus, Reeve, Conch. Icon., t. 25, f. 169 (poor).

Lepidopleurus antiquus, Angas, P.Z.S., 1867, p. 223.

Callistochiton antiquus, Carpenter, MS., and Haddon, "Challenger" Polyplac., p. 20.

Chiton (Callistochiton) antiquus, E. A. Smith, Zool. Coll. "Alert," p. 79.

Callistochiton sarcophagus, Carpenter, MS.

C. antiquus, Reeve: Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 150; Pilsbry, Proc. Acad. Nat. Sci., Philad., 1894, p. 73.

Very often found covered with calcareous matter. I have traced it from Port MacDonnell through both gulfs to St. Francis Island. Some beautiful dark-brown specimens came from Mr. Anderson, of Second Valley, and rich red (iron-stained ?) ones from Cape Jaffa. Its sculpture and rounded appearance easily differentiates it from other chitons. It is our only South Australian *Callistochiton*. "This genus differs from *Ischnochiton* in the peculiar insertion-teeth, which are curved into ribs as if festooned, in the relation of the slits to the external ribs, and in the tail valve, which is often peculiarly humped" (Pilsbry, Man. Conch., ser. i., vol. xiv., p. 260). This chiton has a very wide range, and has been collected by the author in places as far apart as Queensland and Western Australia.

Fam. CHITONIDIÆ, Pilsbry.

25. **Onithochiton ashbyi**, Bednall and Matthews, 1906.

Onithochiton ashbyi, Bednall and Matthews, Proc. Mal. Soc., London, vol. vii., part 2, June, 1906, p. 92.

As far as I am aware, only one specimen of this chiton has been discovered. It was found by Mr. Ashby at Aldinga, and to him I am indebted for the specimen. It is our only *Onithochiton*, and the eyes are of a pearly appearance set in its cream-coloured valves. The smooth warty appearance will easily distinguish this shell.

26. **Chiton tricostalis**, Pilsbry, 1894.

Chiton (canaliculatus, var. ?) tricostalis, Pilsbry: Nautilus, vol. viii., 1894, p. 54.

C. tricostalis, Pilsbry: Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897.

This "handsomely sculptured shell" assumes an endless variety of colour. I have specimens, red and green, pink and black, green and white, creamy, cream with black spots, yellow with black spots, etc. The second valve is often of a distinctive colour. It is *bicostalis* in small specimens, the middle rib in the lateral areas begins when about half-grown. Some valves have four ribs. I have specimens from Capes Jaffa and Jervis, several places in Gulf St. Vincent, Southern Yorke Peninsula, and St. Francis Island. I have collected it in Western Australia, and have specimens from New South Wales.

27. **Chiton calliozona**, Pilsbry, 1894.

Chiton (Æreus, var.) calliozona, Pilsbry: Nautilus, vol. viii., 1894, p. 55.

C. calliozona, Pilsbry: Bednall, Proc. Mal. Soc., London., vol. ii., part 4, April, 1897, p. 151.

This is the largest of our true chitons. I have one dried specimen measuring 55×25 mm. Colour markings very variable; pinks, greens, and bronze-browns are wondrously intermingled, while the minute pearls of the girdle are like rubies, emeralds, etc. It is found on smooth stones in clean sandy pools among seaweed. I have samples from Second Valley, Normanville, Marino, Wool Bay, Hardwicke Bay, and St. Francis Island. Fine specimens were taken at Marion Reef from the shell of living *Pinna inermis* and from broken bottles by Mr. A. R. Riddle. It is very like *Chiton arcus*, Reeve, from New Zealand, but there are marked differences.

28. *Chiton jugosus*, Gould, 1846.

Chiton jugosus, Gould, Proc. Boston Soc. Nat. Hist., ii., 1846, p. 142; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 178; Gould, Expl. Exped., xii., Moll. and Sh., p. 317, atlas, t. 28, f. 430, 1852; Smith, Zool. Coll. "Alert," p. 78, 1884; Haddon, "Challenger" Polyplac., p. 22, 1886; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 151.

C. concentricus, Reeve, Conch. Icon., 1847, sp. 95.

Lophyrus jugosus, Gould, Otia, p. 3, 212, 1862; Angas, P.Z.S., London, 1867, p. 222.

L. concentricus, P.Z.S., 1867, p. 221.

Hedley and Hull's comparison of *C. jugosus*, *C. torri* (*torrianus*), and *C. coxi*, in Records Australian Museum, vol. vii., No. 4, 1909, p. 262, is very valuable. The New South Wales specimens are not, as a rule, as brightly coloured as those from South Australia. Some from Watson Bay, New South Wales, are pink and brown, others a creamy-white in the six median valves, and the whole shell is broader than those from South Australia. The South Australian specimens are uniform in colour, the pale-blue green markings in the sulcations of the pleural areas are very distinct. It is found in fairly deep water, and loves the ocean rocks. I have specimens from Port MacDonnell, Beachport, Robe, Middleton, Cape Jaffa, Cape Jervis, Second Valley, Normanville, Aldinga, Marino, Venus Bay, and St. Francis Island. It has also been found at Kangaroo Island and Corney Point. Specimens from the last place measure 47×25 mm. Strange to say, I have no specimens from Spencer Gulf.

29. *Chiton torrianus*, Hedley and Hull, 1909.

Chiton coxi, Pilsbry; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 151.

C. torri, Hedley and Hull, Records of the Australian Museum, Sydney, vol. vii., No. 4, 1909, p. 262.

C. hullianus, Iredale, Proc. Mal. Soc., London, vol. ix., part 2, June, 1910, p. 103.

C. torrianus, Hedley and Hull, Mal. Soc. Journ., March, 1911, vol. ix., part 4.

Specimens of this very beautiful chiton were misnamed *C. coxi* for some years till the comparison of *C. jugosus*, *C. torrianus*, and *C. coxi*, by Hedley and Hull, *loc. cit.* The concentric lines on all valves differentiate it from *C. coxi*, and the sulcations of the pleural areas make it impossible to put it with *C. jugosus*. It is rarely found in the gulfs. I have collected it from Cape Jervis, Kangaroo Island, and Corney Point. Large numbers were found at the latter place by Mr. Walter Klem. Mr. Bednall reports it from Sultana Bay. I have South Australian specimens measuring 42×25 mm. and Western Australian 52×29 mm. I have collected it all around the coast of Western Australia from Esperance to Fremantle.

30. *Chiton limans*, Sykes, 1896.

Chiton muricatus, A. Adams, Proc. Zool. Soc., 1852 [May, 1854], p. 91, pl. xiii., fig. 6; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 175, pl. xxxvii., figs. 12, 13; non Telesius, Mem. Acad. Sci., St. Petersb., ser. v., vol. ix., 1824, p. 483.

Lophyrus muricatus, Angas, Proc. Zool. Soc., 1865, p. 186, *loc. cit.*, 1867, p. 222.

Chiton limans and *C. carnosus*, Carpenter, MS.: Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 93.

The pointed girdle scales differentiate this rare South Australian chiton from all others of the family in South Australian waters. I have only one specimen from Dr. Verco, labelled Hardwicke Bay, Spencer Gulf. Its colour is a pale-ochreous yellow with light- and dark-brown on the first, second, fourth, fifth, and anterior valve. The markings and girdle scales correspond with specimens of *C. muricatus* from New South Wales.

31. *Chiton exoptandus*, Bednall, 1896.

Chiton exoptandus, Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 152.

This "much desired" chiton is easily distinguished from others by the uniformity of its pinkish colour-marking so well described by Mr. Bednall, *loc. cit.* It runs through all the gradations of a pinkish-yellow to a burnt sienna. One specimen in my possession has a uniform rich reddish brown strip the full length of the dorsal areas of each valve. I have specimens from Second Valley and valves from Normanville. It is frequently found at Marino, Troubridge, and Edithburgh, and is very plentiful at low tides in Wool Bay. I collected one small specimen in the crevice of a rock at Min-

lacowie and a valve at Corney Point. It has been dredged by Dr. Verco, and seems to confine itself to Spencer and St. Vincent gulfs. My specimens are not the largest found, although I have them 45×25 mm.

32. *Chiton bednalli*, Pilsbry, 1895.

Chiton bednalli, Pilsbry: *Nautilus*, ix., 1895, p. 90; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896.

This, the most beautiful of all South Australian *Chitonidæ*, may be only a colour variety of *exoptandus*, but the uniformity of its green colouring differs so much from the pinkish tinges of *exoptandus* that it may well be classified and named after the *doyen* of *Polyplacophora* writers in South Australia. I have a specimen from Sultana Bay, a valve from St. Francis Island, a valve dredged from 25 fathoms in Thorny Passage, and several specimens dredged by Dr. Verco in Gulf St. Vincent. Size, 40×20 mm. One specimen was found by Mr. Kimber at Aldinga (South Australia), and Mr. Sykes reports it from Port Philip.

33. *Chiton verconis*, Torr and Ashby, 1898.

Chiton verconis, Torr and Ashby, Trans. Roy. Soc., S.A., 1898, p. 215.

This chiton strongly resembles the drawings of *Chiton huttoni*, Suter, Trans. N.Z. Inst., vol. xxxviii., 1905, p. 321, pl. xviii., figs. 1-6; but the slope of the tail valve is much steeper in *C. verconis*, and the pointed girdle scales are decidedly different. These scales are very similar to *C. limans*, but in the latter there are no striations. *C. verconis* has been dredged by Dr. Verco in Yankalilla Bay, 9 fathoms; Rapid Head, 9 to 11 fathoms; and in Spencer Gulf. All my specimens have been dredged. Mr. W. D. Reed has dredged it in Spencer Gulf, and it has been taken at Aldinga by Mr. Kimber. I have a very fine specimen labelled Port Fairy (Victoria), from the late Mr. Adcock's collection.

34. *Chiton oruktus*, Maughan, 1900.

Chiton oruktus, Maughan, Trans. Roy. Soc., S.A., 1900, p. 89.

This shell has been found only on the south-east coast of South Australia. One specimen comes from Cape Jaffa and several have been taken at Port MacDonnell. It ought to be in Victorian waters. Mr. Maughan's description is very helpful, but the plates are very indistinct.

35. *Chiton aureo-maculata*, Bednall and Matthews, 1906.

Chiton aureo-maculata, Bednall and Matthews, Proc. Mal. Soc., London, vol. vii., part 2, June, 1906, p. 91.

The type specimen was reported from Marion Reef, Troubridge Island. Mr. Gatcliffe sent me one from Victoria, which at the time I was unable to identify. The Rev. S. J. Martin took a fine specimen at Minlacowie. I have three specimens—one about the size of the type specimen, dredged by Dr Verco in Backstairs Passage (?), one from Corney Point, and the other from Port MacDonnell. It is probably a deep-water shell. I have been unable to detect the "golden spots" on any of my specimens, but one was identified by Mr. Matthews. It is similar to *C. verconis* and *C. limans*, but the girdle scales differentiate it from either. Mr. Martin's specimen is very handsome, a bright reddish-brown colour all over, mottled with dark splashes. It measures 19 × 11 mm.

36. *Lorica volvox*, Reeve, 1847.

Chiton volvox, Reeve, Conch. Icon., sp. 31; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 237.

C. cimolius, Reeve, Conch. Icon., sp. 14.

Lorica cimolia, H. and A. Adams, Ann. Mag. N.H. (2), ix., p. 355; Angas, P.Z.S., 1867, p. 224; 1871, p. 97.

Aulacochiton volvox, Shuttl., Bun. Mittheil, 1853, p. 68.

Chiton rudis, (?) Hutton, Trans. N.Z., Inst., iv., 1872, p. 179; Man. N.Z. Moll., 1880, p. 113.

Lorica volvox, Reeve: Haddon, "Challenger" Polyplac., p. 31; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 153; Suter, Proc. Mal. Soc., London, vol. vii., part 5, June, 1907, p. 297.

I have specimens from Cape Jaffa, Normanville, Second Valley, Marino, Wool Bay, Hardwicke Bay, Corney Point, and some very handsome specimens, with dark-brown dorsal areas, measuring 76 × 45 mm., from St. Francis Island. It has been dredged by Dr. Verco in Gulf St. Vincent, and Mr. A. R. Riddle reports it from Black Hill, near Port Moorowie. In one or two samples I have noticed spiny tufts similar to the *Acanthochitidæ*. I cannot detect any sign of tufts in full-grown specimens. *L. volvox* is often encrusted with limy matter.

37. *Loricella angasi*, Adams and Angas, 1864.

Lorica angasi, H. Adams and Angas, Proc. Zool. Soc., 1864, p. 193; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 238.

Loricella angasi, Adams and Angas: Pilsbry, Proc. Acad. Nat. Sci., Philad., 1894, p. 87; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 153.

Found in deep water, sometimes washed up on the beach after storms. It is reported from Sultana Bay (Matthews),

Rapid Bay (Angas), Holdfast Bay (Bednall), and New South Wales (Cox, Brazier). I have specimens dredged by Dr. Verco in Backstairs Passage, and either good specimens or valves from Cape Jervis, Normanville, Aldinga, and Brighton. The splashes of pink colouring are very vivid when preserved in spirits. The peculiarly large and broad anterior valve easily differentiates this species from *L. volvox*. It flattens itself so closely to the rocks and is so covered with foreign growth that I have had the greatest difficulty in detecting one on a rock which I had been examining for some minutes.

Fam. MOPALIIDÆ, Pilsbry.

38 *Plaxiphora albida*, Blainville, 1825.

Chiton albidus, Blainville, Dict. Sci. Nat., 1825, vol. xxxvi., p. 547; Pilsbry, Man. Conch., 1893, vol. xv., p. 105.

C. glaucus, Quoy and Gaimard, Voy. "Astrolabe," Zool., 1834, vol. iii., p. 376.

(?) *C. petholatus*, Sowerby, Mag. Nat. Hist., new series, iv., p. 289, May, 1840; Conch. Illustr., f. 64, 65, and var. *porphyrius*, f. 59.

Chatopleura conspersa, Adams and Angas, P.Z.S., 1864, p. 193; P.Z.S., 1865, p. 187.

Plaxiphora albida, Blainville: Thiele, Zool. Chun, 1909, Heft lvi., p. 24, pl. iii., figs. 22, 23.

P. tasmanica, Blainville: Thiele, *loc. cit.*, p. 25, pl. iii., figs. 24-26.

P. bednalli, Blainville: Thiele, *loc. cit.*, p. 25, pl. iii., figs. 27-30.

P. petholata, Sowerby: Pilsbry, Man. Conch., vol. xiv., p. 323; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 154.

P. albida, Blainville: Iredale, Proc. Nat. Soc., London, vol. ix., part 2, June, 1910, p. 98.

South Australian chiton-hunters will always be grateful to Mr. Iredale for his elaborate paper on the *Plaxiphoras*, and to Dr. Thiele for his "Revision des Systems der Chitonen." But we part with the old name of *petholata* with regret. Sowerby's description of *petholata*, *loc. cit.*, is a complete account of our *albida*, while Blainville's description of *albida* in Pilsbry, *loc. cit.*, is very poor, and might be that of any of our *Plaxiphora*. Is not there a danger in making the posterior valve the basis of decision? I have several hundred specimens of *Plaxiphora* before me from all parts of Australia, most of them collected by myself, and the tail valves differ so much in the same species according to size and growth that I agree with Iredale that Dr. Thiele, "through lack of specimens, has laid too much stress upon the value of the shape of the valves." The three South Australian *Plaxi-*

phora are easily separated. The zigzag markings of *albida* (? *petholata*), the smooth reticulated markings of *costata* (? *glauca*), and the strongly raised nodules of the lateral area in *matthewsi* (? *conspersa*) make the separation easy except in worn specimens.

Mr. Gatcliffe, of Victoria, has taken considerable pains in identifying the *Plaxiphora*, and agrees with Dr. Thiele in identifying our *P. glauca* with *P. albida*, Blainville.

P. albida is often found at and above high-water mark, and generally adheres to one spot without moving about like other chitons. At Robe I have seen hundreds alive, blistering in the sun. I have collected it all around the coast of South Australia, from Port MacDonnell to Streaky Bay, as well as Queensland, Victoria, and Tasmania. Going out from Streaky Bay 40 miles to St. Francis Island, *P. costata* takes the place of *albida*, and that would seem to continue right on to Western Australia, for I obtained *costata* at Albany, Bunbury, Rottneest Island, and saw nothing of *albida*.

I don't know if pearls are often found in chitons, but I extracted a blue egg-shaped pearly substance from the interior edge of a *Plaxiphora albida*.

39. *Plaxiphora matthewsi*, Iredale, 1910.

Plaxiphora conspersa, non Adams and Angas: Bednall, Proc. Mal. Soc., London, 1897, vol. ii., p. 154.

P. matthewsi, Iredale, Proc. Mal. Soc., London, vol. ix., part ii., June, 1910, p. 99.

This is the rarest of South Australian *Plaxiphora*. It is found in deeper water than either *albida* or *costata*. Its great breadth in proportion to its length easily distinguishes it from either of these. I have specimens from Marino, Troubridge, Second Valley, and St. Francis Island. I have also collected it on the north-west coast of Tasmania. Iredale's description, *loc. cit.*, is very good, but the absence of plates is a hindrance to identification.

The description of *Chatopleura conspersa*, Adams and Angas, P.Z.S., 1864, p. 193; Angas, P.Z.S., 1865, p. 187, agrees so well with *matthewsi* that I place it under a new nomenclature with considerable diffidence.

A very pretty half-grown specimen was taken by Mr. F. L. Saunders at Port Noarlunga. The nodules on the lateral areas are like tear-drops.

40. *Plaxiphora costata*, Blainville.

Chiton costatus, Blainville, Dict. Sc. Nat., xxxvi., p. 548; Pilsbry, Man. Conch., vol. xv., p. 105.

C. glaucus, Quoy and Gaimard, Voy. "Astrolabe," Zool., iii., p. 376.

P. glauca, Quoy and Gaimard: Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 154; Pilsbry, Man. Conch., ser. i., vol. xiv., p. 325; Suter, Journ. Mal., 1905, vol. xii., part 4, p. 66.

Plaxiphora costata, Blainville: Iredale, Proc. Mal. Soc., London, vol. ix., part 2, June, 1910, p. 97; Thiele, Zool. Chun., 1909, Heft lvi., p. 24.

Mr. Gatliffe, of Victoria, identifies this shell with *P. bednalli*, Thiele.

I have specimens from Port MacDonnell, Robe, Middleton, Bluff, Encounter Bay, Second Valley, Noarlunga, Wool Bay, Troubridge, Hardwicke Bay, Spencer Gulf, and St. Francis Island. Only an occasional specimen is found on the South-East coast. Numbers were found at Port Noarlunga by Mr. F. L. Saunders. It is more common in Spencer Gulf, and is abundant on St. Francis Island. I have also collected it in Tasmania and in several places in Western Australia. Blainville's description of this shell, in Pilsbry's Manual, *loc. cit.*, is very unsatisfactory. Quoy and Gaimard's description of *P. glauca* does not correspond with my specimens in every particular. I can find no marginal striæ in the anterior portions of the valves. The whole of the shell in unworn specimens is covered with minute microscopic granulations or reticulations. Some specimens have beautiful parallel longitudinal lines of green and black on the median valves. It has seven or eight riblets on the anterior valves.

Fam. ACANTHOCHITIDÆ, Pilsbry.

41. *Acanthochites asbestoides*, Smith, 1884.

Chiton (Acanthochiton) asbestoides, Carpenter, MS.: Smith, Zool. Coll. "Alert," p. 83, pl. vi., fig. 6; Pilsbry, Man. Conch., ser. i., vol. xv., p. 17.

Acanthochites asbestoides, Carpenter: Pilsbry, Proc. Acad. Nat. Sci., Philad., 1894, p. 79; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 155.

Pilsbry's description of the Fam. *Acanthochitidæ* is very helpful. The South Australian species are constantly being increased, and a splendid opportunity awaits a student who will make this field a special study. The *Acanthos.* differ from nearly all other chitons by having tufts at the sutures, by the large fleshy girdle, and there being little or no distinction between the lateral and pleural areas.

The golden or silvery tufts of *asbestoides*, lying neatly along the suture between the valves, easily distinguishes it from other *Acanthos.*

I have found it in numbers in a sheltered cave at high-water mark on Kangaroo Island. I have specimens from

Beachport, Aldinga, Ardrossan, Stansbury, Point Soutar, Minlacowie, Streaky Bay, and all along the West Coast to St. Francis Island, Albany (Western Australia), and San Remo (Victoria). Dr. Verco has dredged it in Gulf St. Vincent.

Tom Iredale, in Proc. Mal. Soc., London. vol. ix., part 3, September, 1900, p. 155, quotes Dr. Thiele ("Revision des Systems der Chitonen," i., p. 48), "that *lueurii*, Blainville, must replace the familiar *asbestoides*, Smith."

42. *Acanthochites bednalli*, Pilsbry, 1894.

Acanthochites bednalli, Pilsbry, Proc. Acad. Nat. Sci., Philad., 1894, p. 81; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896.

After going through a great number of specimens of this species and *A. granostriatus*, I am unable to separate them. A series shows the striations in the dorsal area to vary from almost smooth to deep microscopic sulci. I have only one specimen of *A. coxi* from New South Wales. If it had been found in South Australia, I should certainly put it in with *A. bednalli*.

It occurs all around the coast of South Australia. Specimens in my collection are from the South-East (Port MacDonnell, Middleton), Gulf St. Vincent (Second Valley, Normanville, Aldinga, Marino, Sultana Bay (Troubridge), Spencer Gulf (Corney Point, Minlacowie), West Coast as far as St. Francis Island. A number of very large specimens, measuring 30 × 14 mm., were found at Kangaroo Island. I have similar ones from Port MacDonnell, Troubridge, and the West Coast.

43. *Acanthochites granostriatus*, Pilsbry, 1894.

Acanthochites granostriatus, Pilsbry: Nautilus, vol. vii., 1894, p. 119; Proc. Acad. Nat. Sci., Philad., 1894, p. 81, pl. ii., figs. 1-6, pl. iv., fig. 37; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897.

Similar to *A. bednalli*. Found all along the coast from Port MacDonnell to St. Francis Island.

44. *Acanthochites speciosus*, H. Adams, 1861.

Cryptoplax (Notoplax) speciosus, H. Adams, Proc. Zool. Soc., 1861, p. 385.

Acanthochites speciosus, H. Adams: Pilsbry, Man. Conch., ser. i., vol. xv., p. 32, pl. i., figs. 23-26; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 156; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 91.

A. (Notoplax) speciosus, H. Adams: Pilsbry, Proc. Acad. Nat. Sci., Philad., 1894, p. 83, pl. iv., figs. 31-33.

This very hairy chiton, with a girdle, when alive, four or five times wider than the tegmentum, is rare. I have specimens from Aldinga, Marino, Stansbury, and St. Francis Island. Dr. Verco dredged some very large specimens in Gulf St. Vincent. I have one specimen from Stansbury with three very distinct horny riblets on the anterior valve. This may be a monstrosity or a new variety of *speciosus*. I found one specimen at Albany, Western Australia, in which the riblets in the interior valve are distinct but nodulose. Mr. Maughan found a fine specimen washed ashore at Aldinga.

45. *Acanthochites (Notoplax) matthewsi*, Bednall and Pilsbry, 1894.

Acanthochites matthewsi, Bednall and Pilsbry: Nautilus, vol. vii., 1894, p. 120; (*Notoplax*?) Pilsbry, Proc. Acad. Nat. Sci., Philad., 1894, p. 83, pl. iv., figs. 27-30; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 156; Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 91.

This is the most beautiful and elaborately sculptured of all South Australian *Acanthochitidæ*. It somewhat resembles *A. glyptus*, Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 92. I have specimens from Robe, Cape Jaffa, Normanville, Marino, and valves (?) from St. Francis Island. I have seen them collected by Rev. S. J. Martin at Wool Bay. Mr. F. L. Saunders has taken it at Port Victor. A number of specimens were taken from the stomach of a whiting caught near Edithburgh. Robe specimens in spirits measure 30×15 mm. The girdle is very fleshy and wider than the valves themselves. They are of a very delicate milky colour, crossed with splashes of green. Pilsbry evidently had only a dried specimen. The specimens from Cape Jaffa and Normanville are of a ruddy tint—stained, I think, by their proximity to some ferruginous matter on lighthouse or jetty. One remarkable feature in nearly every specimen collected has been the presence of a light-green marking at the beak of the dorsal area on the fifth valve. This helps to distinguish this shell in nearly every instance.

46. *Acanthochites (Loboplax) variabilis*, Adams and Angas, 1864.

Hanleya variabilis, Adams and Angas, Proc. Zool. Soc., 1864, p. 194; Pilsbry, Man. Conch., ser. i., vol. xv., p. 101.

Acanthochites (Notoplax?) variabilis, Pilsbry, Proc. Acad. Nat. Sci., Philad., 1894, p. 84.

A. (Loboplax) variabilis, Adams and Angas: Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 156; Hedley and Hull, Records Australian Museum, vol. xii., No. 4, 1909, p. 266.

This is the most widely distributed of all South Australian *Acanthochitons*. I have found it all around the coast from Port MacDonnell to St. Francis Island. It is found on the South-East coast, St. Vincent and Spencer gulfs, and on the West Coast as well as on Kangaroo Island. I have specimens from twenty-three different places. The pinnatifid appearance of the dorsal area and the very tiny spicules at the sutures, sometimes only horny protuberances, easily differentiate this species from other *Acanthos*. It assumes every variety of shade and colour from a creamy-white to almost black, greens generally predominating. Lighter - coloured varieties are plentiful on Kangaroo Island and the west coast of Yorke Peninsula.

In young specimens the girdle of the *Acanthos* is very small, but when full-grown it has a large fleshy girdle, often twice as wide as the tegmentum. If not kept in spirits this girdle shrinks up considerably.

47. *Acanthochites crocodilus*, Torr and Ashby, 1898.

Acanthochites crocodilus, Torr and Ashby, Trans. Roy. Soc., S.A., 1898, p. 216, pl. vi., fig. 2.

Two specimens were found at a very low tide at Marino, one valve was taken by Mr. Klem at Corney Point, and Mr. Hedley, Records Aus. Mus., vol. vii., No. 2, 1908, Hedley and May, reports having taken it off the coast of Tasmania. May and Torr, Proc. Roy. Soc., Tasmania, 1912, pp. 35, 36, say this is not *crocodilus*.

The remarkably foliated appearance of the dorsal area and the shagreened pustules on the latero-pleural area make it easy to distinguish this rare species.

48. *Acanthochites cornutus*, Torr and Ashby, 1898.

Acanthochites cornutus, Torr and Ashby, Trans. Roy. Soc., S.A., 1898, p. 217, pl. vi., fig. 3.

This is evidently a deep-water species. It was dredged by Dr. Verco in 14 fathoms off Ardrossan. Mr. A. R. Riddle took one at Wool Bay. Specimens have been taken at Marino, Normanville, and St. Francis Island.

Its pinnatifid dorsal area, decided carination, and regular rows of pustules are its distinguishing features. Mr. Hedley found eyes on the dorsal area of *A. cornutus*. He used $\frac{1}{4}$ -in. lens.

49. *Acanthochites* (*Notoplax*) *wilsoni*, Sykes, 1896.

Acanthochites (*Notoplax*) *wilsoni*, Sykes, Proc. Mal. Soc., London, vol. ii., part 2, July, 1896, p. 92, pl. vi., figs. 2, 2a.

A. verconis, Torr and Ashby, Trans. Roy. Soc., S.A., 1898, p. 217, pl. vi., figs. 4a-f.

I have to thank Mr. Hedley for drawing my attention to the similarity between *A. wilsoni* and *A. verconis*. I have gone through a number of specimens. There is a great difference between the small and large specimens in colour-markings, the smaller being pearly-white mottled with rose-pink and seemingly more carinated, while the larger specimens are reddish to a deep maroon tint.

Taken in dredgings in St. Vincent and Spencer gulfs by Dr. Verco, by Mr. Ashby at Aldinga, Mr. Kerrison at Cape Jaffa, by Mr. Basset Hull on Long Reef (New South Wales), and by the writer at Robe, Marino, Kingscote, and Minlacowie.

Sykes' description is ably assisted by Mr. Hedley's drawings in Torr and Ashby's paper, *loc. cit.*

50. *Acanthochites maughani*, Torr and Ashby, 1898.

Acanthochites maughani, Torr and Ashby, Trans. Roy. Soc., S.A., 1898, p. 218, pl. vii., figs. 5a-f; Hedley and Hull, Records Australian Museum, vol. vii., No. 4, 1909, p. 265.

This species has been found only at Port Victor (Maughan), Bottle and Glass Reef, and Freshwater Bay, New South Wales (Hedley and Hull). I have a number of New South Wales specimens in spirits.

Acanthochites lachrymosus, May and Torr, just being published (1912) by the Royal Society of Tasmania, is somewhat similar to *A. maughani*. The shell is much larger, 26×10 mm., but on comparing a co-type with the type of *maughani*, though there is a striking resemblance in detail, there are decided differences.

51. *Acanthochites exilis*, Torr and Ashby, 1898.

Acanthochites exilis, Torr and Ashby, Trans. Roy. Soc., S.A., 1898, p. 218, pl. vii., figs. 6a-f.

Three specimens of this very diminutive chiton were dredged by Dr. Verco in 15 fathoms in Spencer Gulf. It is the smallest of all our South Australian *Polyplacophora*, and may be easily distinguished by the bright-red dorsal area of the third valve. One very handsome specimen, measuring 3×2 mm., was dredged by Dr. Verco in 15 fathoms off Wallarog.

52. *Acanthochites tatei*, Torr and Ashby, 1898.

Acanthochites tatei, Torr and Ashby, Trans. Roy. Soc., S.A., 1898, p. 219, pl. vii., figs. 7a-f.

One specimen only of this beautiful little *Acantho* was found at Middleton, Encounter Bay, by the writer. Mr. Gabriel reported finding one at Torquay, Victoria.

53. *Acanthochites costatus*, Adams and Angas, 1864.

Acanthochites costatus, Adams and Angas, P.Z.S., 1864, p. 194; Angas, *loc. cit.*, 1867, p. 224.

Macandrellus costatus, Dall, Proc. U.S. Nat. Mus., i., p. 81, f. 40 (dentition).

Chiton (Macandrellus) costatus, E. A. Smith, Zool. Coll. "Alert," p. 83, t. 6, fig. F.

Acanthochites costatus, Adams and Angas: Pilsbry, Man. Conch., ser. i., vol. xv., p. 40, pl. iii., fig. 74.

I have seen two specimens of this chiton. It was taken by Mr. Klem at Corney Point and named by Mr. Bednall. One other very similar I have from St. Francis Island. This shell agrees with the description in Pilsbry, *loc. cit.*, with the exception of the colour, which is of a pinkish hue, and the posterior valve has not the "six more or less distinct radiating ridges," as described by Smith from Coppinger's collection. Mr. Klem's specimen has a hairy girdle. The St. Francis Island specimen is fleshy.

Fam. CRYPTOPLACIDÆ, Dall.

54. *Cryptoplax striatus*, Lamarck, 1819.

Chitonellus striatus, Lamarck, An. S. Vert., vi., p. 317, 1819; Desh. in Lam., vii., pp. 481, 136; Sowerby, Genera of Shells, t. 139, f. 4; Conch. Illustr., f. 62; Blainville, Dict. Sc. Nat., xxxvi., p. 555, 1825; Reeve, Conch. Syst., ii., t. 135, f. 1; Conch. Icon., f. 4.

C. gunnii, Reeve, Conch. Icon., f. 5, 1847.

C. rostratus, Reeve, *loc. cit.*, f. 6.

C. oculatus, Reeve, *loc. cit.*, f. 7a,b (not of Quoy and Gaimard).

Cryptoplax striata—gunnii—rostrata, H. and A. Adams, Gen. Rec. Moll., i., p. 484; Angas, P.Z.S., 1867, pp. 224, 225.

Chiton (Chitonellus) striatus, Smith, Zool. Coll. "Alert," p. 84.

Cryptoplax striatus, Haddon, "Challenger" Report, xv., p. 39, t. 1, f. 9; t. 3, f. 9a-9m.

C. striatus, Lamarck, var. *gunnii*, Reeve; Bednall, Proc. Mal. Soc., London, vol. ii., part 4, April, 1897, p. 157; Torr, Trans. Roy. Soc., S.A., 1911, p. 100.

After examination of a large number of specimens from many parts of Australia, I have satisfied myself that the

Chitonellus striatus of Lamarck describes our South Australian species admirably. Most of the specimens are covered with soft velvet seal-like hair, which hardens into bristles when dried. I have a few hairless specimens, but this may be accounted for by local attrition or disease. The breadth of the valves varies so much in *striatus* that there seems no room for var. *gunnii*.

C. striatus is found all around the coast of Australia and Tasmania. I have collected it in about twenty places on the South Australian coast from Port MacDonnell to Nuyt Archipelago. The valves in some specimens are of a rich deep salmon-pink, while others are a dark-brown. The girdle is of a nut-brown when alive, going darker as it dries. It delights in the recesses of bunches of *Serpularia*, and I have taken macerated specimens from the stomach of a schnapper. I have seen living specimens nearly a foot long. I have dried ones 90 × 10 mm.

55. **Callochiton mayi**, Torr, 1912. Pl. v., figs. 1a-f.

C. mayi, Torr, Proc., Roy. Soc. Tasmania, 1912, p. 1.

General Appearance.—Shell oblong, very much elevated, strongly carinated, side slopes straight. *Colour*.—Creamy-white variegated with splashes of reddish-brown; the anterior and posterior valves are nearly always red, and this colour extends to the girdle.

Anterior Valve.—Red, smooth to the unaided eye, but microscopically regularly granulated and dotted all over with minute black dots which look like eyes, 14 to 16 pectinated teeth.

Median Valve.—*Lateral area* distinctly raised, smooth or with slight growth-lines. A broad shallow transverse sulcus in the centre of the area containing numbers of eye-dots somewhat regularly arranged. On one lateral area on one side of a valve 61 of these eye-dots were counted.

Pleural area deeply longitudinally sulcated with eight to twelve grooves, extending from the margin to the dorsal area, but growing shorter towards that area.

Dorsal area triangular, with microscopical irregular striations running into the pleural area.

The median valves have two distinct slits.

Posterior Valve.—Divided into two distinct areas by a raised riblet, the posterior part being similar in colour and granulations to the anterior valve, and the upper part creamy-white with splashes of red, microscopically granulated, numerous eye-dots, mucro median. The division between the two parts of this valve is very distinct. The pleural area has the same longitudinal sulci as that of the median valve.

Interior of Shell.—Porcelaneous, with raised riblets on posterior part of valve, sinus shallow and wavy, sutural laminae very short.

Girdle.—Covered with irregular appressed spinelets, coarser towards the outer margin. In curled specimens these spines are erect, creamy-white with red spashes.

Measurement.— 10×5 mm.

Hab.—Dredged by Dr. Verco in Spencer Gulf. One specimen was found by the writer on the north-west coast of Tasmania, and another from the same locality is in the possession of Mr. Basset Hull.

Remarks.—I have had considerable difficulty in determining the *genus* of this shell. It has pectinated teeth and eyes like *Tonicia*, but the girdle is not leathery, nor are the valves so polished. It may be a *Chatopleura*. The description is repeated, as the dredged South Australian specimens differ from the account given by Dr. Torr in the Proc. Roy. Soc., Tasmania. No eye-dots can be seen in the Tasmanian specimen.

56. *Lepidopleurus pelagicus*, *sp nov.* Pl. v., figs 2a-f.

General Appearance.—Ovate, decidedly arched and strongly carinated. Side slopes straight. The shell gradually tapers towards the tail valve. The valves overlap the girdle. *Colour.*—Uniform, pale sulphur-yellow; the girdle has a slightly deeper shade, almost brown when dried.

Anterior Valve.—Broader than the median valves. It has three or four concentric grooves or growth markings parallel to the girdle, crossed by a number of minute striations converging towards the apex. The interior is pearly-white. No dentition nor sutural laminae. The posterior edge of the valve is serrated.

Median Valve.—The lateral area is gradually elevated above the central area. The whole of the valve is covered with minute tubercles in longitudinal rows in the dorsal and pleural areas. Under the microscope, these appear like strings of beads. The rows are transverse in the lateral areas. The sutural plates are diminutive and semi-transparent, the sinus very broad. The posterior edge of the valve is serrated. Interior pearly and semi-transparent, the striations of the tegmentum distinctly shows through.

Posterior Valve.—Mucro median elevated, with concave slope to girdle. Pustulose liræ converge to the mucro. Sutural plates delicately diminutive.

Girdle.—Leathery and spiny to the unaided eye. Under $1\frac{1}{2}$ -in. lens it is covered with minute specules.

Measurement.—Dried, 8 × 4 mm.

Hab.—Dredged by Dr. Verco from 130 fathoms off Cape Jaffa. Several valves were dredged from 300 fathoms off the south-east coast of South Australia.

Remarks.—In detail this shell strongly resembles *Lepidopleurus inquinatus*, but the whole shell is much more carinated and the lateral areas differ in the massing of the pustules.

57. *Ischnochiton bednalli*, *sp. nov.* Pl. v., figs. 3a-f.

General Appearance.—Elliptical, valves wide, rounded, slightly carinated, side slopes curved, cream colour uniform in valves and girdle. The posterior margins of the valves project considerably and give a verandah-like appearance. The valves are exceedingly delicate.

Anterior Valve.—Two or three ill-developed grooves or growth-lines parallel to the girdle crossed by about twenty microscopically pustulose liræ converging towards the apex. About twenty slits with regularly scalloped pectination between.

Median Valve.—Dorsal area uniform in width composed of five or six rows of pustules either worn or compressed. Pleural areas divided into five irregular diagonal rows of pustules by reticulated sulci, which gives the appearance of open network. Lateral areas distinctly raised and crossed transversely with four rows of pustulose liræ converging towards the dorsal area. Four of these pustules project from the posterior margin. Interior pearly-white. Valves project considerably. Sutural laminae small and delicate. Sinus very wide. Diminutive slit rays under $\frac{1}{4}$ -in. lens.

Posterior Valve.—Mucro ante-median almost covered by the seventh valve. Concave between the mucro and the girdles. The mucro is covered with pustules, and the rest of the valve has two or three concentric rings of pustulose liræ parallel to the girdle. The pustules grow smaller towards the mucro. About twenty-six slit rays.

Girdle.—Covered with microscopically striated scales.

Hab.—Two specimens only from St. Francis Island, Nuyt Archipelago, Australian Bight.

Measurement.—Dried specimen, 6 × 3 mm.

Remarks.—I have named this chiton after Mr. Bednall, the doyen of Polyplacophora work in Australia. It is an exquisite chiton, and somewhat resembles *Ischnochiton pilsbryi* and *Lepidopleurus inquinatus*.

58. *Acanthochites rufus*, *sp. nov.* Pl. vi., figs. 4*a-f*.

General Appearance.—Elliptical, roundedly arched, much more so than *A. variabilis*, valves beaked, colour uniformly terra-cotta.

Anterior Valve.—Five very indistinct riblets, which are really waves in the pustules. The pustules are in regular lines, appearing continuous with those on the second valve.

Median Valve.—Covered with pustules arranged in longitudinal liræ. There is little difference between the dorsal, lateral, and pleural areas. There are about twelve rows of these pustules on the latero-pleural area divided by sulci, and about fourteen rows on what may be termed the dorsal area. The microscopic pustules in these are much smaller than those in the latero-pleural areas. There is a gradual elevation towards the posterior end of each valve, and the pustules in this lateral region are more irregular.

Posterior Valve.—Mucro very indistinct, post median. A deep sulcus parallel to the girdle separates it from the outer edge of the shell. Rows of pustules converge towards the mucro and appear continuous with the rows on the median valves. Nine rows on the latero-pleural areas and twelve on the dorsal areas. The mucro is almost at right angles to the girdle, and the rows of pustules are concentric below the mucro.

Girdle.—Leathery, very narrow in dried specimen, covered with spinelets. Five corneous spots on the girdle surrounding the anterior valve and one at each suture, very indistinct in some.

Measurement.—10 × 5 mm.

Hab.—One specimen only from Kangaroo Island.

Remarks.—The detailed description of this shell approaches *A. variabilis*, but the absence of the distinction between the dorsal and the latero-pleural areas and the marked difference in the appearance and shape of the shells when placed side by side make it necessary to place it in a new species.

The name *rufus* is given on account of its rich terra-cotta colour.

59. *Acanthochites kimberi*, *sp. nov.* Pl. vi., figs. 5*a-f*.

General Appearance.—Long, narrow, tapering towards the ends. Valves rounded, beaked. *Colour*.—Either cream with splashes of dark- and light-green or, in some specimens, the green predominating over the cream with splashes of pink on some valves.

Anterior Valve.—Three sharply-defined riblets. Covered with rounded or oblong pustules larger at the margin and decreasing in size towards the apex. Interior pearly. Insertion plates deep, three slits.

Median Valve.—Dorsal area, wedge-shaped, foliated, covered with microscopic triangular pustules. Alternate black and white spots separate the dorsal from the pleural areas. Latero-pleural area, covered with irregular rounded and elliptical tubercles, small near the dorsal area, growing much larger as they approach the girdle and the posterior edge. Sinus broad, insertion plates deep, one slit on each side.

Posterior Valve.—Diminutive, mucro median, a distinct dorsal area similar to the median valves with irregular pustules below the mucro. Five microscopic riblets run from the mucro to the eaves. The dorsal area is concave. Articulation, bluish-green, rounded, excavated, deep insertion plates, two slits.

Girdle.—Leathery, covered with spinelets. Five erect silvery tufts stand out prominently around the anterior valve and one tuft at each suture. The hollows in which these tufts are placed is surrounded by a prominent ridge.

Hab.—Aldinga (by Mr. Kimber, after whom the shell is named), Kangaroo Island.

Measurement.—Dried specimen, 10 × 4 mm.

Remarks.—I have four specimens, varying somewhat in appearance, but similar in detail.

60. *Ischnochiton levis*, *sp. nov.* Pl. vi., figs. 6a-f.

General Appearance.—Smooth, rounded, decidedly carinate, pale-cream colour with spots of yellow, very broad in proportion to length, valves narrow.

Anterior Valve.—Smooth, except for a series of concentric growth-lines, microscopically granulated.

Median Valve.—Regular growth-lines appear over the dorsal, lateral, and pleural areas. The lateral areas are slightly raised, the growth-lines making four very large fine longitudinal riblets. The pleural area is minutely reticulated.

Posterior Valve.—Mucro ante-central. Two distinct areas, dorsal and pleural, consisting of microscopic regular granulations. The rest of the valve is smooth, almost flat, with two or three concentric lines. Eight or nine irregular slits.

Girdle.—Covered with rounded scales, microscopically striated.

Measurement.—12 × 6 mm.

Hab.—Edithburgh (Mr. Matthews).

Remarks.—This belongs to the smooth variety of *Ischnochitonidae*. It resembles *I. wilsoni*, but its surface is not so granular. My one specimen is damaged. The name *levis* is given on account of its smoothness.

61. ***Acanthochites rubrostratus***, *sp. nov.*

Pl. vii, figs. 7a-f.

General Appearance.—Shell elliptical, broad, girdle wider than the valve. Tegmentum cream-coloured, dorsal areas bright-green tipped with rosy-pink, which gives it its name.

Anterior Valve.—Three to five distinct pustulose riblets with probably five slits. My dissected specimen was damaged. In one co-type the pustulated riblet becomes one elongated pustule. The tegmentum is covered with flattened pustules.

Median Valve.—The lateral area is separated from the pleural area by a rib covered with pustules. The lateral and pleural areas are covered with nine rows of rounded appressed pustules, somewhat regular, converging towards the apex. The dorsal area is narrow, corneous, showing growth-lines, no striæ, somewhat foliated, one slit.

Posterior Valve.—Mucro posterior with rows of pustules between it and the girdle, to which it is at right angles. A dorsal area is seen which is almost smooth with irregular pustules on the sides. The interior is pearly, deeply hollowed, five slits, insertion plates large.

Girdle.—Leathery covered with minute spinelets, having long silky tufts at the sutures and five tufts around the anterior valve. In a spirit specimen the girdle is as wide as the valves.

Measurement.—Dried specimen, 11 × 6 mm.

Hab.—Two specimens from St. Francis Island and one collected by Mr. Baker at Henley Beach.

Remarks.—Somewhat resembles *A. speciosus*, but the girdle is very much smaller and is not continued between the valves. The *Acantho* tufts are also much more decided than in *speciosus*.

62. ***Ischnochiton bakeri***, *sp. nov.* Pl. vii., figs. 8a, b, c, f.

General Appearance.—Shell almost round, valves narrow, flattened, colour greyish-white mottled with brown.

Anterior Valve.—Covered with microscopic imbricating pustules, closely packed, resembling girdle scales.

Median Valve.—Dorsal area, triangular, smooth, spotted. Lateral areas distinctly raised with four or five irregular pustules. Median valves covered with microscopic granules.

Posterior Valve is missing.

Girdle.—Covered with imbricating striated scales. The outer edge of the girdle is fringed with delicate specules.

Measurement.— 4×3 mm.

Hab.—Henley Beach (Mr. Baker).

Remarks.—Strongly resembles a juvenile *Loricella angasi*, but its striated girdle-scales distinguish it. I have much pleasure in naming it after its discoverer.

EXPLANATION OF PLATES.

- a—Dorsal view of entire shell.
- b—Anterior valve.
- c—Median valve.
- d—Posterior valve.
- e—Lateral view of posterior valve.
- f—Portion of girdle magnified.

The sizes of type specimens are marked in each case.

PLATE V.

- 1a,b,c,d,e,f—*Callochiton, mayi*, Torr.
- 2a,b,c,d,e,f—*Lepidopleurus pelagicus*, sp. nov.
- 3a,b,c,d,e,f—*Ischnochiton bednalli*, sp. nov.

PLATE VI.

- 4a,b,c,d,e,f—*Acanthochiton rufus*, sp. nov.
- 5a,b,c,d,e,f—*Acanthochiton kimberi*, sp. nov.
- 6a,b,c,d,e,f—*Ischnochiton levis*, sp. nov.

PLATE VII.

- 7a,b,c,d,e,f—*Acanthochites rubrostratus*, sp. nov.
 - 8a,b,c,d,e,f—*Acanthochites bakeri*, sp. nov.
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